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[54] **CROSSBOW WITH COILED SPRING FORCE DEVELOPING MEANS FOR PROJECTING AN ARTICLE**

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[51] Int. Cl. **F41b 5/00**

[58] Field of Search **124/25, 35 R, 41, 40, 22, 124/26, 27, 30 R; 33/265, 233**

[56] **References Cited**

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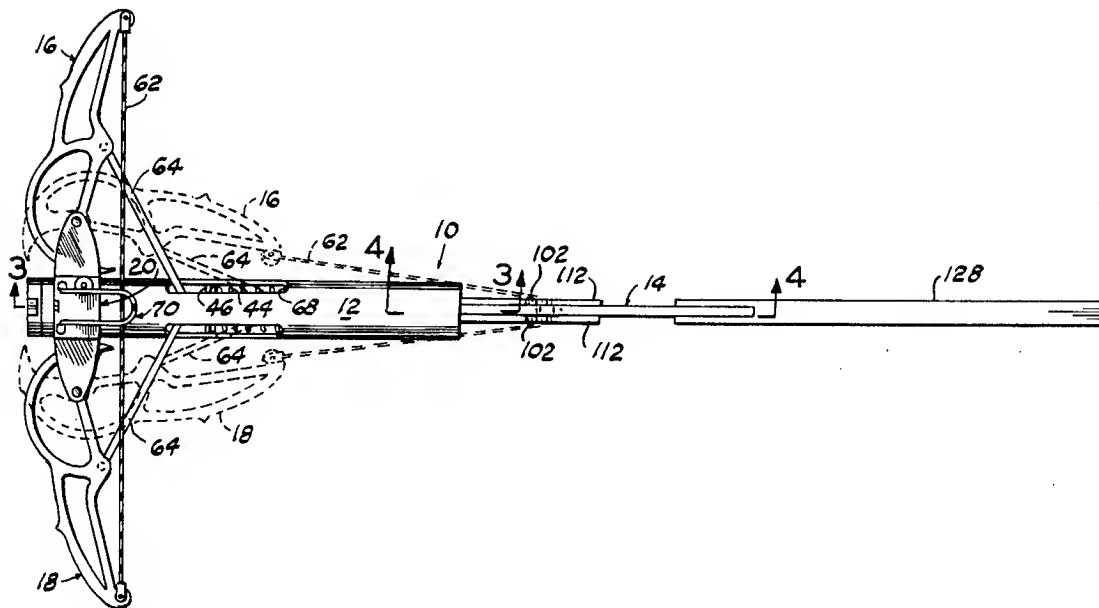
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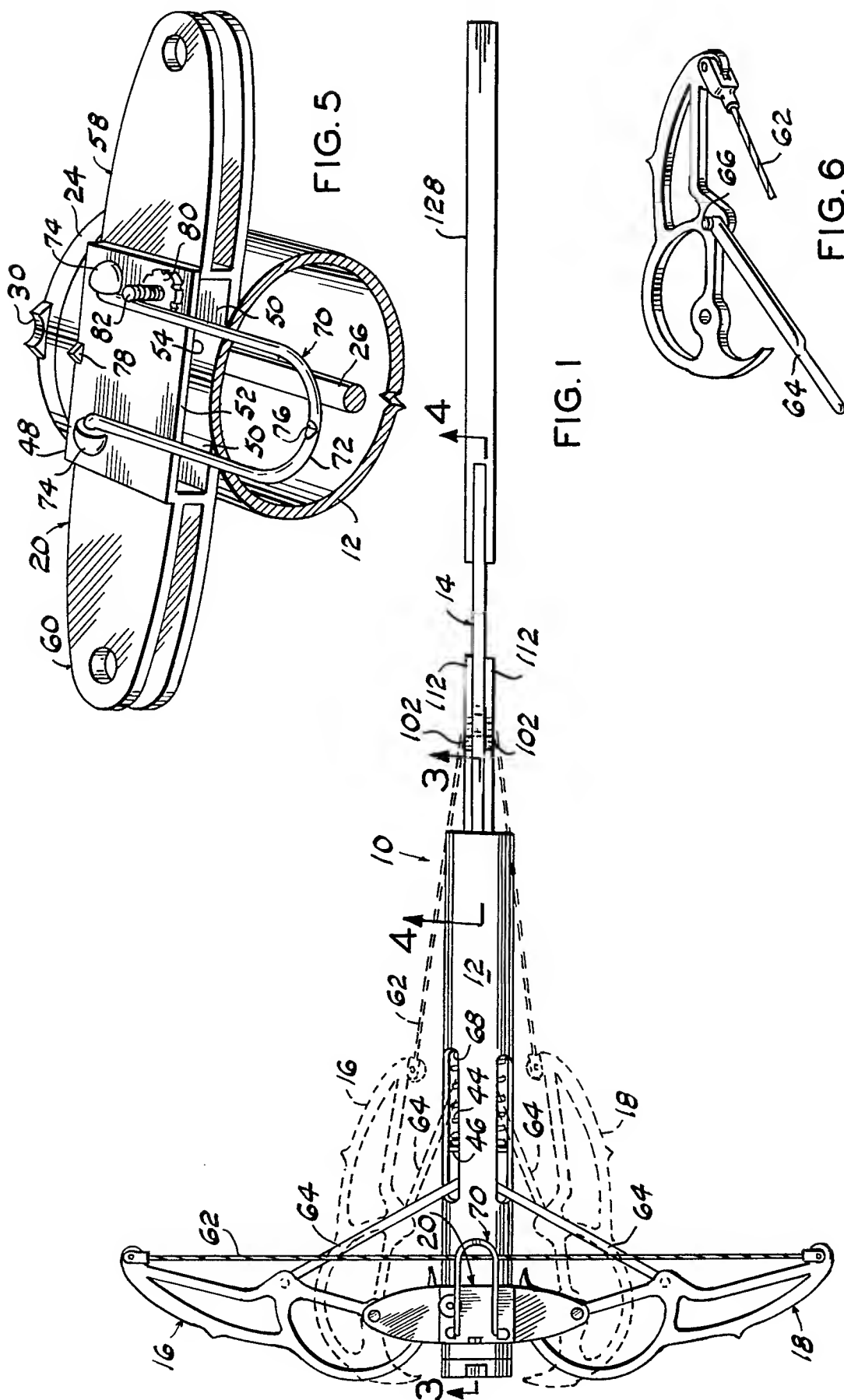
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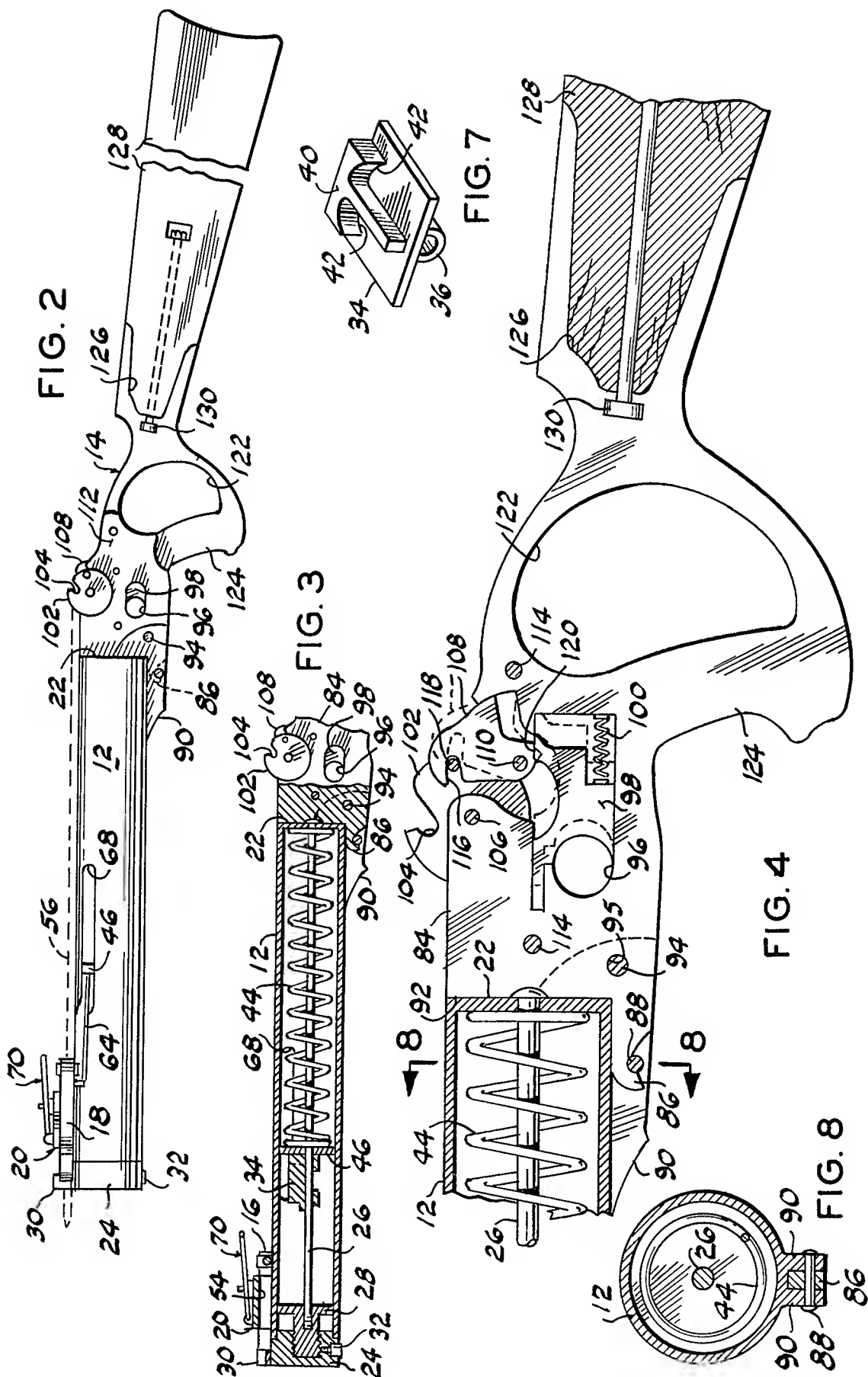
[57] **ABSTRACT**

An elongated casing is connected at one end with a bow string trigger released mechanism and gunstock. A pair of bow string interconnected wings are pivotally connected to the other end portion of the casing with the wings and being normally biased forwardly in aligned opposition transversely of the casing by a spring within the casing bearing against one end of push rods pivotally engaging, at their other ends, the respective wing intermediate its ends. Adjustable sight means is secured to the casing between the pair of wings.

4 Claims, 8 Drawing Figures







CROSSBOW WITH COILED SPRING FORCE DEVELOPING MEANS FOR PROJECTING AN ARTICLE

BACKGROUND OF THE INVENTION

Field of the Invention

The present invention relates to crossbows and more particularly to a carbine-type crossbow.

SUMMARY OF THE INVENTION

An elongated casing is connected at one end with a guntype stock having trigger means for holding and releasing the bow string. A bracket, transversely overlying and secured to the other end portion of the casing, pivotally mounts one end portion of a pair of wings interconnected at their other ends by a bow string. The casing contains a compression spring which biases a follower toward the forward end of the casing. The follower being slidably supported by a rod coaxially disposed within the casing. A pair of push rods extend at one end portion through elongated slots formed in the casing wall for engagement with the follower and are pivotally engaged at their other ends with the respective wing intermediate its ends. Sight means, supported by the wing mounting bracket, is adjustable for aiming a quarrel, overlying and supported by the casing, toward a target.

The principal object is to provide a carbine-type crossbow having a trigger equipped crossbow string holding and releasing means and further including a casing containing a compression spring normally biasing a pair of wings, pivotally connected with the casing, forwardly in a quarrel discharging action.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a top view of the crossbow illustrating the wings in cocked position by dotted lines;

FIG. 2 is a side elevational view of the crossbow illustrating a supported quarrel by dotted lines;

FIG. 3 is a fragmentary vertical cross sectional view taken substantially along the line 3—3 of FIG. 1;

FIG. 4 is a fragmentary vertical cross sectional view, to an enlarged scale, partially in elevation, taken substantially along the line 4—4 of FIG. 1;

FIG. 5 is a fragmentary perspective view, to a further enlarged scale, of the forward end portion of the casing and the wing mounting bracket;

FIG. 6 is a fragmentary inverted perspective view of one of the crossbow wings and push rod;

FIG. 7 is a perspective view of the spring urged push rod follower; and,

FIG. 8 is a vertical cross sectional view taken substantially along the line 8—8 of FIG. 4.

Like characters of reference designate like parts in those figures of the drawings in which they occur.

In the drawings:

The reference numeral 10 indicates the crossbow which is substantially carbine-like in general appearance comprising a casing 12 having a gunstock portion 14 connected to one end of the casing and having a pair of wings 16 and 18 pivotally connected to the other end portion of the casing by bracket means 20. The casing 12 is elongated tubular having a rearward closed end 22 and its forward end closed by a cap 24. A rod 26, substantially coextensive with the casing 12, extends through the casing end 22 and is threadedly connected with a guide flange lug 28 in turn threadedly connected

coaxially with the cap 24. The cap 24 is provided with a quarrel rest or guide 30 (FIG. 5) with the cap being maintained in a fixed position relative to the casing by a set screw 32. A push rod plate 34, having apertured lugs 36 surrounding the rod 26, is slidable longitudinally therealong. The push rod plate 34 is platform-like and is loosely received by the bore of the casing 12 and includes an upstanding T-shaped projection 40 on its surface opposite the lugs 36 forming opposing push rod end receiving recesses 42 for the purposes presently explained.

A compression spring 44 surrounds the rod 26 and extends between the inner surface of the casing end wall 22 and a follower disk 46 surrounding the rod adjacent the push rod plate 34 for normally urging the push rod plate toward the forward end of the casing.

The winging mounting bracket 20 includes a central box-like body portion 48 having a divided lower horizontal wall 50 rigidly secured, as by welding, to the outer surface of the casing thus disposing its upper horizontal wall 52 in spaced relation with respect to the upwardly disposed surface of the casing and defining an opening 54 through which the quarrel 56 extends as indicated by dotted lines (FIG. 2). Laterally projecting vertically spaced and apertured pairs of ears 58 and 60 are secured to respective sides of the bracket body 48 for pivotally connecting one end portion of the respective open frame-type wings 16 and 18 thereto. A bow string 62 extends between and is connected with the other end of the wings 16 and 18. A pair of push rods 64 pivotally contact, at one end portion, a pin 66 depending from the respective wing intermediate its ends and project at their other end portions, through elongated slots 68 cooperatively formed in the casing 12 and nested by the respective push rod plate recess 42 so that the spring 44 normally maintains the wings 16 and 18 in the solid line position of FIG. 1.

Sight means 70 is mounted on the bracket body 48 and comprises a substantially U-shaped member 72 having its leg ends pivotally connected respectively with a pair of socket forming lugs 74 secured to the upper wall 52 of the bracket for vertical pivoting movement of the bight portion of the U-shaped member. The bight portion of the U-shaped member is provided with a sight notch 76 aligned with a sight 78 secured in upstanding relation to the upper surface of the bracket wall 52. A sight adjusting nut 80 is threadedly received by an upstanding screw 82 secured to the mounting bracket wall 52 adjacent one of the legs of the U-shaped member 72 with the screw 82 and nut 80 being calibrated for raising and lowering the bight portion of the U-shaped member a predetermined distance in accordance with the distance between the crossbow 10 and a target, not shown, toward which the quarrel 56 is to be launched.

The stock portion 14 comprises a central plate portion 84 having a hook-shaped forwardly projecting end portion 86 for engagement with a pin 88 extending between a pair of parallel walls 90 secured in depending relation to the rearward end portion of the casing. The forward end surface 92 of the plate 84 abuts the casing end 22 and is secured in this position by a shaft 92 removably received by a hole 95 transversely drilled through the plate 84 and walls 90. The plate 84 is provided with a trigger and finger receiving recess 96 slidably receiving a trigger 98 normally urged forwardly by a spring 100. A pair of bow string latches 102, disk-like

in general configuration, each having a bow string receiving notch 104, is axially connected flatly on respective side surfaces of the plate 84 by a latch pin 106.

A catch 108 is pivotally mounted, at one end portion in the plane of the plate 84, by a catch pin 110 extending transversely through a pair of plates 112 flatly overlying respective lateral surfaces of the plate 84 and secured thereto by plate pins 114. The catch 108 is provided with a latch notch 116 releasably engaging a latch shaft 118, extending transversely between and secured to the pair of latches 102, thus when the trigger 98 is in its forward solid line position of FIG. 4, its rearward platform surface 120 underlies, in contacting relation, a cooperating depending surface of the catch 108 and maintains the bow string latches in a locked position. Rearward movement of the trigger 98 releases the catch 108 to pivot rearwardly about its pin 110, as shown by dotted lines (FIG. 4), and in turn releasing the latches 102 thus permitting spring pressure applied to the wings 16 and 18 by the push rods 64 to launch the quarrel 56.

The rearwardly projecting end portion of the plate 84 is provided with a hand receiving opening 122 forming a pistol-type hand grip portion 124 and defining a rearwardly open substantially U-shaped socket 126 at its rearward end which cooperatively nests the forward end portion of a gunstock 128 which is maintained in place by bolt and nut means 130.

OPERATION

In operation the latch disks 102 are disposed, as shown by solid lines, and held in cocked position by the catch 108. A quarrel 56 is placed on the upper surface of the casing 12 with its forward end extending through the wing mounting bracket opening 54 and supported by the quarrel guide recess 30 with its rearward end portion disposed between the disks 102 adjacent the bow string. The bow string being engaged medially its ends with the disk notches 104. The sight means is usually previously adjusted in accordance with the estimated distance to the target. The crossbow is aimed by the sight means and the trigger 98 is manually released to discharge the quarrel.

Obviously the invention is susceptible to changes or alterations without defeating its practicability, therefore, I do not wish to be confined to the preferred embodiment shown in the drawings and described herein.

I claim:

1. A crossbow, comprising:

a casing having a forward end and a rearward end and having opposing longitudinal slots in its wall intermediate its ends;

wing mounting bracket means transversely connected to the forward end portion of said casing for pivoting mounting a pair of wings;

a pair of wings respectively connected, at one end portion, to respective end portions of said bracket

means for pivoting movement of their other end portions toward and away from said casing;

a bow string extending between and connected with said other end portions of said wings;

an elongated compression spring within said casing; push rod means passing through said slots and interposed between said wings and said spring for transferring a biasing force exerted by said compression spring, when the latter is compressed, to said other end portion of said wings in a forward direction to pivot the wings forwardly and cause the bow string to exert a force on a projectile and project a projectile forwardly;

a plate member connected with the rearward end of said casing; and,

trigger means supported by the forward end portion of said stock for releasably holding said bow string in crossbow cocked position.

2. The crossbow according to claim 1 in which said trigger means includes:

a pair of disk latch members respectively flatly connected to opposing side surfaces of said stock in coaxial alignment,

each said latch member having a bow string receiving recess in its peripheral surface,

said stock having a recess communicating with said pair of latch members;

a pair of side plates respectively flatly overlying opposing side surfaces of said stock;

a catch pivotally mounted within the stock recess between said side plates and releasably engaging said pair of latch members; and,

a trigger slidable within the stock recess and releasably supporting said catch.

3. The crossbow according to claim 2 in which said push rod means includes:

a rod coaxially supported by said casing;

a follower longitudinally slidably supported by said rod within said casing,

said follower having opposite push rod receiving recesses;

and,

a pair of push rods respectively nested at one end portion by the respective follower recess and pivotally contacting at their other ends the respective said wing intermediate its ends.

4. The crossbow according to claim 3 and further including:

sight means mounted on said bracket means,

said sight means comprising a front sight mounted on the uppermost surface of said bracket means,

a U-shaped receiving sight mounted on said bracket means for vertical pivoting movement, and,

receiving sight adjusting means mounted on said bracket means.

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